UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/038,916	01/08/2002	Ming Jia	22493-149U (14769ROUS02U)	1307

31292 7590 01/05/2010

CHRISTOPHER & WEISBERG, P.A.
200 EAST LAS OLAS BOULEVARD
SUITE 2040
FORT LAUDERDALE, FL 33301

EXAMINER	
GHULAMALI, QUTBUDDIN	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
01/05/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/038,916	Applicant(s) JIA ET AL.	
	Examiner Qutbuddin Ghulamali	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *18-32,34 and 35* is/are allowed.

6)☒ Claim(s) *1-16,36,37,40 and 41* is/are rejected.

7)☒ Claim(s) *38* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responsive to amendment filed 10/12/2009.

Response to Remarks

2. Applicant's arguments with respect to claims 1-16, 36, 40 and 41, have been fully considered but they are not persuasive. The applicant remarks, page 13, Stein does not disclose or suggest mapping and de-mapping signals, rather Stein discloses a modulation and demodulation scheme. The examiner disagrees and most respectfully would like to present with reference to Stein, fig. 2, the demodulator 214 shown in the receiver and modulator 120 shown in the transmitter, fig. 1. It is commonly known in the art with modulation and demodulation scheme that a modulator provides mapping and a demodulator provides de-mapping of the mapped signal it receives. For example, modulation process facilitates the transfer of information over a medium. Sound, for instance, requires conversion for transmission through medium such as phone line or radio, and the process of converting information, in this case voice, so that it can be successfully sent through a medium (wire or radio waves) is called modulation, modulation employ techniques such as Binary phase shift keying (BPSK) among other techniques such as Quadrature phase shift keying (QPSK) that vary parameter of a sinusoid to represent information to be sent (transmitted), the parameter can be amplitude, phase and frequency. Modulation is a process of mapping such that it takes for instance voice (as an example of a signal) converts it into some aspect of a sine wave and then transmits it leaving the actual voice behind, the sine wave (carrier) on the other side is remapped back to a near copy of sound. Getting back to Stein, Stein

discloses modulator 120 which modulates (maps) the frame to be transmitted (a CDMA modulator), the modulated data frame is provided to a transmitter 122 for transmission through antenna 124 to the receiver, the receiver system 200 receives via antenna 210 receives it at block 212 which is than provided to demodulator 214 (a CDMA demodulator) for demodulation (de-mapping). The demodulator (de-mapper) is in a chain prior to correlation (correlator block 234). The demodulator (de-mapper 214) prior to correlator (234) in Stein compares substantially the same when compared to fig. 2 in the instant case (de-mapper 236 prior to correlator 250). Stein therefore, obviously teach/suggest mapping and de-mapping signals resulting in substantially similar result. The applicant further remarks, page 13, combination of ten Brink and Stein is improper as the de-mapper of ten Brink receives input from a correlator. As highlighted in Stein disclosure the demodulator does de-mapping prior to input to correlator as an apparent reason to combine the elements of the prior art in the fashion claimed by the present invention. The applicant is reminded that the strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. In re Sernaker, 702 F. 2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983. In this case, ten Brink and Stein disclose the advantage for such a combination. The examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine,* 837 F. 2d 1071, 5 USPQ 2d 1596 (Fed. Cir. 1988) and *In re Jones,* 958 F. 2d 347, 21 USPQ 2d 1941 (Fed. Cir. 1992). In the instant case, ten Brink and Stein are analogous art because they are from the same problem solving, applying appropriate coding or recoding, mapping and de-mapping and correlating signals applied to source data, and therefore, reads on the limitation as claimed in claims 1 and 11.

As per applicant's remarks, page 15, ten Brink, Stein and Dent is improper because ten Brink and Stein fail to disclose symbol de-mapper being adapted to perform symbol de-mapping on said sequence of received symbols to produce a sequence of soft data element decisions, and a correlator, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, and the re-encoded output sequence produced by the encoder, said correlator being adapted to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence, as highlighted above, the examiner considers combination to be proper for reasons noted above and therefore, combination of Dent with ten Brink and Stein is considered to be appropriate based on not hindsight but rather based on clear disclosure noted above revealing information that properly reads on the limitation as claimed.

As per applicant's remarks, page 16, regarding dependent claims 2, 3, 12 and 13, the remarks presented above in support to claims 1 and 11 apply to dependent claims as well. Similarly applicant's remarks, page 17-21, regarding claims 4-6, 14-16,

7-10, the remarks presented above with reference to claims 1 and 11 equally apply, see remarks above for further explanation and reason to combine.

As per applicant's remarks, page 22-23, Tiedemann fail to teach or suggest re-encoding the recovered fast signaling message so as to produce known pilot symbols, the examiner disagree because Tiedemann discloses such a feature see (page 3, section 0044, lines 13-29) that reads on limitation for a re-encoding the recovered fast signaling message so as to produce known pilot symbols, The combination therefore, is proper, rejection of claims 36, 37 maintained.

As per applicant's remarks, page 24-25, regarding claims 40-41, Walton does not discloses a set of parameter signaling symbols are transmitted on the overhead channel such that at a receiver, they can be decoded accurately, re-encoded, and the re-encoded symbols treated as known pilot symbols which can then be used for channel estimation. The examiner disagrees and respectfully draws applicant's attention to Walton, wherein discloses a transmitter and a transmit antenna wherein a set of transmission parameter signaling symbols are transmitted on the overhead channel (data channel) with strong encoding (increased reliability) such that at a receiver, they can be decoded accurately, re-encoded, and the re-encoded symbols treated as known pilot symbols which can then be used for channel estimation (page 9, section 0100, 0101; page 10, section 0103, 0104; page 11, section 0112. 0114). What Walton does not show is the phrase overhead channel. However, it is generally well known in the art for example MIMO OFDM that known data symbols such as pilots are routinely transmitted to receiving units or receivers regarded as overhead or preambles on

transmit channels for channel estimation or joint channel estimation, frequency offset acquisition and symbol timing estimation at the MIMO OSDM receiver and therefore a person skilled in the art would readily be cognizant with such commonly known available features in the art. Overhead channels may not be equivalent to data channels however, overhead can include data information or data field and a transmitter can adapt to combine pilot and transmission parameters on a single overhead within an OFDM signal, as would be obvious to on e skilled in the art of signal transmission in the field of data and pilot communication. The rejection therefore, maintained.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 11, are rejected under 35 U.S.C. 103 (a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and further in view of Dent et al (US Pub. 2003/0036359).

Regarding claims 1 and 11, Brink discloses a transmitter and a receiver adapted to transmit and receive comprising:

a symbol de-mapper (fig. 3, element 24), receiving as input a sequence of received symbols over the channel whose quality is to be measured, said symbol de-mapper being adapted to perform symbol de-mapping on said sequence of received symbols to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

a soft decoder, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper, said soft decoder being adapted to decode the sequence of soft data element decisions to produce a decoded output sequence (page 5, lines 22-38).

Brink, however does not explicitly disclose, an encoder, receiving as input the decoded output sequence produced by the soft decoder, said encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence; and

a correlator receiving as input the sequence of soft data elements to produce a channel quality indicator output by determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence.

Stein, in a similar field of endeavor discloses:

an encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24); and

a correlator, receiving as input the sequence of soft data element decisions produced by the symbol de-mapper (demodulator 214, see details above in response to remarks by the applicat), and the re-encoded output sequence produced by the encoder, said correlator determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence (col. 3, lines 1-16). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an encoder to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence, and a correlator to determining a correlation between the sequence of soft data element decisions and the re-encoded output sequence as taught by Stein in the system of Brink because the re-encoding can provide a higher rate of confidence with the received data and a correlator for correlation between sequences can indicate that no error exists in the received data frame.

Brink and Stein even though disclose limitation as recited above, however, does not explicitly disclose correlator being adapted to produce a channel quality indicator (CQI) wherein the CQI is fed back to a transmitter in determining and applying an appropriate coding rate and modulation. Dent, however, discloses correlator being adapted to produce a channel quality indicator (CQI) wherein the CQI is fed back to a transmitter (page 7, section 0088, 0090; page 9, sections 0107, 0108, 0109, 0110; page 11, section 0123; page 18, section 0223). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator and feeding back the CQI to a transmitter as taught by Dent in the combined

communication system of Brink and Stein because it can provide individual information symbol streams, for expected cross-correlation interference using symbol rate processing, based spreading codes used in coder and on the determined downlink channel characteristics, to minimize interference between signals destined for different receivers, spread spectrum coder encodes the pre-compensated symbol streams, for transmission compensating the corresponding input symbol streams, for cross-correlation interference determined from the loop-back signals.

5. Claims 2, 3, 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brink (USP 6,611,513) and Stein (USP 6,175,590), in view of Dent et al (US Pub. 2003/0036359) and further in view of Jones et al (USP 6,215,813).

Regarding claims 2, 3, 12 and 13 Brink, Stein, Dent combined disclose all of limitations of the claim above. The combination however, is silent regarding symbol de-mapper is adapted to perform QPSK symbol de-mapping and Euclidean distance. However, Jones, in a similar field of endeavor discloses a symbol de-mapper is adapted to perform QPSK symbol de-mapping and least squared Euclidean distance to the transmission symbol from the received symbol. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK symbol de-mapping and least squared Euclidean distance as taught by Jones in the combined system of Brink, Stein, and Dent because it can enhance bandwidth performance efficiency in communication system with relatively high processing gain.

6. Claim 4, is rejected under 35 U.S.C. 103 (a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and further in view of Dent et al (US Pub. 2003/0036359).

Regarding claim 4, Brink discloses a transmitter and a receiver adapted to transmit and receive comprising:

a symbol de-mapper (fig. 3, element 24), receiving as input a sequence of received symbols over the channel whose quality is to be measured;

symbol de-mapping (de-mapper) said sequence of received symbols to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

decoding sequences of soft data element decisions to produce a decoded output sequence (a soft value on information bits, fig. 3, elements 26, 27, 28) (col. 5, lines 22-38).

Brink, however does not explicitly disclose re-encoding decoded output sequence to produce a re-encoded output sequence, using a code identical code to a code used in encoding the source data element sequence. Stein, in a similar field of endeavor discloses re-encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said re-encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to re-encode decoded output sequence as taught by Stein in

the system of Brink because it can provide a higher rate of confidence with the received data. The combination of Brink and Stein does not explicitly show correlating re-encoded sequence of soft data elements to produce a channel quality indicator output. However, Dent discloses correlator correlating encoded sequence to produce a channel quality indicator (CQI) output (page 7, section 0088, 0090; page 9, sections 0107, 0108, 0109, 0110; page 11, section 0123; page 18, section 0223). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Dent in the combined communication system of Brink and Stein because it can provide individual information symbol streams, for expected cross-correlation interference using symbol rate processing, based spreading codes used in coder and on the determined downlink channel characteristics, to minimize interference between signals destined for different receivers.

7. Claims 5, 6, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brink (USP 6,611,513) and Stein (USP 6,175,590) in view of Dent et al (US Pub. 2003/0036359) and further in view of Jones et al (USP 6,215,813).

Regarding claims 5, 6, 15 and 16, Brink, Stein, and Dent combined disclose all limitations of the claim. The combination however, does not explicitly disclose symbol de-mapper is adapted to perform QPSK symbol de-mapping and Euclidean distance. Jones in a similar field of endeavor discloses a symbol de-mapper is adapted to perform QPSK symbol de-mapping and least squared Euclidean distance to the transmission

symbol from the received symbol. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK symbol de-mapping and least squared Euclidean distance as taught by Jones in the system of Brink, Stein, and Dent because it can enhance performance in bandwidth and system efficiency with relatively high processing gain.

8. Claim 7, is rejected under 35 U.S.C. 103 (a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and further in view of Dent et al (US Pub. 2003/0036359)

Regarding claim 7, Brink discloses a transmitter and a receiver adapted to transmit and receive comprising:

a symbol de-mapper (fig. 3, element 24), receiving as input a sequence of received symbols over the channel whose quality is to be measured;

symbol de-mapping (de-mapper) said sequence of received symbols to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

decoding sequences of soft data element decisions to produce a decoded output sequence (a soft value on information bits, fig. 3, elements 26, 27, 28) (col. 5, lines 22-38).

Brink, however does not explicitly disclose re-encoding decoded output sequence to produce a re-encoded output sequence, using a code identical code to a code used in encoding the source data element sequence. Stein, in a similar field of endeavor

discloses re-encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said re-encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to re-encode decoded output sequence as taught by Stein in the system of Brink because it can provide a higher rate of confidence with the received data. The combination of Brink and Stein does not explicitly show correlating re-encoded sequence of soft data elements to produce a channel quality indicator output. However, Dent discloses correlator correlating encoded sequence to produce a channel quality indicator (CQI) output (page 7, section 0088, 0090; page 9, sections 0107, 0108, 0109, 0110; page 11, section 0123; page 18, section 0223). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Dent in the combined communication system of Brink and Stein because it can provide individual information symbol streams, for expected cross-correlation interference using symbol rate processing, based spreading codes used in coder and on the determined downlink channel characteristics, to minimize interference between signals destined for different receivers.

9. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brink (USP 6,611,513) and Stein (USP 6,175,590), in view of Dent et al (US Pub. 2003/0036359) and further in view of Thomas (US Pub. 2002/0051498).

Regarding claim 8, Brink, Stein, and Dent combined disclose all of limitations of the claim above. The combination however, is silent regarding symbol de-mapper is adapted to perform QPSK symbol de-mapping and Euclidean distance. However, Thomas, in a similar field of endeavor discloses a symbol de-mapper is adapted to perform QPSK symbol de-mapping and least squared Euclidean distance to the transmission symbol from the received symbol (page 9, sections 0137, 0138). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use QPSK symbol de-mapping and least squared Euclidean distance as taught by Thomas in the combined system of Brink, Stein, and Dent because it can enhance bandwidth and performance in efficiency in the system with relatively high processing gain.

Regarding claim 9, Brink, Stein, and Dent in combination disclose all limitations of the claim except, does not explicitly show said sequence of received symbols comprises Euclidean distance conditional LLR de-mapping. Thomas in a similar field of endeavor discloses sequence of received symbols comprises Euclidean distance conditional LLR de-mapping (page 3-4, section 0062). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Euclidean distance conditional LLR de-mapping as taught by Thomas in the combined art of Brink,

Stein, and Dent because it can minimize error rate in the transmission of signals and optimize synchronization.

With reference to claim 10, Brink, Stein, and Dent in combination disclose all limitations of the claim except, does not explicitly show decoding of sequence of soft data element decisions to produce output sequence further comprises using a history of the soft data element decisions, and using information about encoding of the sequence of symbols transmitted over the channel. Thomas in a similar field of endeavor discloses decoding of sequence of soft data element decisions to produce output sequence further comprises using a history of the soft data element decisions, and using information about encoding of the sequence of symbols transmitted over the channel (page 6, section 0090). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use Euclidean distance conditional LLR de-mapping as taught by Thomas in the combined art of Brink, Stein, and Dent because it can minimize error rate in the transmission of signals and optimize transmission time.

10. Claim 14, is rejected under 35 U.S.C. 103(a) as being unpatentable over ten Brink (US patent 6,611,513) in view of Stein (USP 6,175,590) and further in view of Dent et al (US Pub. 2003/0036359).

Regarding claim 14, Brink discloses a method of modulation and coding (encoding) comprising:

transmitting (fig. 3, element 10) over a channel a sequence of symbols produced by encoding (encoder 11) and constellation mapping a source data element sequence (col. 4, lines 60-67; col. 5, lines 1-10);

receiving a sequence of received symbols over the channel (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

symbol de-mapping (fig. 3, element 24), said sequence of received symbols to produce to produce a sequence of soft data element decisions (see abstract, page 1, lines 63-67; page 2, lines 1-3; page 4, lines 60-67; page 5, lines 10-20);

decoding said sequence of soft data element decisions to produce a decoded output sequence (page 5, lines 22-38).

Brink, however does not explicitly disclose, an encoder, re-encoding decoded output sequence to produce a re-encoded output sequence using a code identical to a code used in encoding the source data element sequence. Stein, in a similar field of endeavor discloses re-encoder (236), receiving as input the decoded output (230) sequence produced by the soft decoder, said re-encoder being adapted to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence (col. 5, lines 57-67; col. 6, lines 1-24). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a re-encoder to re-encode the decoded output sequence with an identical code to a code used in encoding the source data element sequence to produce a re-encoded output sequence, as taught by Stein in the system of Brink because the re-encoding can provide a higher rate of confidence with

the received data frame. Brink and Stein, however, do not explicitly disclose correlating re-encoded output sequence and sequence of soft data element decisions transmitting CQI using channel quality indicator determine and apply appropriate coding rate and modulation to data sequence. However, Dent discloses correlator correlating encoded sequence to produce a channel quality indicator (CQI) output (page 7, section 0088, 0090; page 9, sections 0107, 0108, 0109, 0110; page 11, section 0123; page 18, section 0223). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize channel quality estimation or indicator as taught by Dent in the combined communication system of Brink and Stein because it can provide individual information symbol streams, for expected cross-correlation interference using symbol rate processing, based spreading codes used in coder and on the determined downlink channel characteristics, to minimize interference between signals destined for different receivers.

11. Claim 36, is rejected under 35 U.S.C. 103 (a) as being unpatentable over Zhu et al (USP 7,085,314) in view of Tiedemann, JR. et al (US Pub. 2006/0094460).

Regarding claims 36, 37 Zhu discloses a method of generating pilot symbols from an OFDM frame in a receiver comprising:

processing the encoded symbols based on a scattered pattern to recover the encoded signaling message (col. 8, lines 52-67; col. 9, lines 57-67; col. 12, lines 1-37). Zhu does not explicitly show re-encoding recovered signaling message (scattered pilots) so as to produce known pilot symbols in the scattered pilot pattern; and

determining a channel response for the encoded symbols using decision feedback. However, Tiedemann in a similar field of endeavor discloses re-encoding the fast signaling message so as to generate pilot symbols in the scattered pattern (page 3, section 0044, lines 13-29); and determining a channel response for the encoded symbols using decision (compares the re-encoded symbols with the demodulated signal to obtain an estimate to control processor) feedback (page 3, section 0044, lines 20-29, section 0045). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use re-encoding the fast signaling message so as to generate known pilot symbols in the scattered pattern, and determining a channel response for the encoded symbols using decision feedback as taught by Tiedemann in the system of Zhu because it can allow control of power in the transmission of symbols and mitigate the impact of random errors.

12. Claims 40-41 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Walton et al (US Pub. 2006/0105761).

Regarding claim 40, Walton discloses a transmitter wherein a set of transmission parameter signaling symbols are transmitted on the overhead channel (data channel) with strong encoding (increased reliability) such that at a receiver, they can be decoded accurately, re-encoded, and the re-encoded symbols treated as known pilot symbols which can then be used for channel estimation (page 9, section 0100, 0101; page 10, section 0103, 0104; page 11, section 0112, 0114). What Walton does not show is the phrase overhead channel. However, it is generally well known in the art for example

MIMO OFDM that known data symbols such as pilots are routinely transmitted to receiving units or receivers regarded as overhead or preambles on transmit channels for channel estimation or joint channel estimation, frequency offset acquisition and symbol timing estimation at the MIMO OSDM receiver and therefore a person skilled in the art would readily be cognizant with such commonly known available features in the art.

Regarding claim 41, Walton discloses a receiver adapted to decode a received signal containing the encoded transmission parameter signaling symbols as modified by a channel, re-encode the decoded symbols to produce known pilot, compare the received symbols with the known pilot symbols to produce a channel estimate (page 9, section 0100, 0101; page 10, section 0103, 0104; page 11, section 0112, 0113, 0114).

Allowable Subject Matter

13. Claims 18-32, 34 and 35 allowed.

14. Claim 38 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutbuddin Ghulamali whose telephone number is (571)-272-3014. The examiner can normally be reached on Monday-Friday, 7:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QG.
January 1, 2010.

/CHIEH M FAN/
Supervisory Patent Examiner, Art Unit 2611